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ABSTRACT

Contemporary media and communication technology are expanding educational possibilities and probably will alter fundamentally the structure of educational institutions. As yet, however, only the surface has been scratched in applying media and technology to education. Moreover, early experiments, such as closed circuit television, either are not regarded as successful or have not received major acceptance. To make a genuine contribution to effective schooling, new technologies such as computers must be carefully woven into the fabric of the schools. In California, the Commission on Teacher Credentialing for the Future is a state agency that has taken on the task of considering the role of computers in teacher preparation and certification. The agency's primary responsibility is to establish standards for the preparation of public school personnel. The commission desires to produce teachers with skills for the 1990s and the next century. It has proposed the establishment of a multistage credentialing process, and currently is conducting a survey to determine what standards related to computer literacy should be established for future teachers. Besides the necessary amount of skill training, teachers need to be trained in both the potential gains and losses resulting from the use of computer technology. (KH)

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GLOBAL SOCIETAL TRENDS AND THE NEW TECHNOLOGY: IMPLICATIONS FOR TEACHER CREDENTIALING

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The New Technology in Perspective

The excursion into future trends in teaching and technology begins with a brief look at some of the technological possibilities. Contemporary media and communication technology are expanding educational possibilities and, potentially, affecting the structure of educational institutions. The massive impact of media and technology in out-of-school applications make it an unavoidable fact of life for children and youth. Currently, media's greatest use is for entertainment rather than formal education and, unless its undeniable power is harnessed for education, there is a danger of seeing a world in which the trivial, magnified by technology, may overwhelm the substantive which lives in out-of-date scholastic environments.

School improvement can focus on (1) making current educational programs more effective, (2) bringing new content or teaching processes into the school and (3) creating new institutional forms for education, built around recent and emerging media and technology. The various media and technological forms can be brought to bear on all of these levels of school improvement. Designers of better education have to

reckon with technology--consider its weaknesses--and search for the most productive ways of combining it with human resources. For the solution is not to pit people against machines but to use them in productive combination.

Technology, including the media of communication, teases with the possibility of creating new and more satisfying ways of life. It promises to stretch the possibilities for personal growth and common action. Seeking to solve the problems of our cities, computer simulation helps in the comprehension of complex processes and reduces them to manageable terms. Concurrently, technology frightens by increasing the potential for violence and social control. The tendency to violence, for example, is magnified by broadcast television as it indiscriminately searches for plot lines and dramatic episodes. Similarly, the mission to destroy the starship, or avoid being eaten by Pac-Man, causes many to pause and speculate on the social merit of the video game. In education, technology increases the potential for both good and bad schooling. Trivial content, taught in a more powerful way, becomes menacing. Unfair testing practices--standardized, automated, and authoritatively administered--become nightmarish.

To find ways in which communication and technology can enhance society rather than exaggerating its defects is one of the major tasks in education. The fact that powerful communications media technology has been developed that can affect all aspects of our lives is not an issue. Only the surface has been scratched in applying communications media and

technology to education. Technologists in education generally feel that early efforts to use media and technology in the classroom have been relatively unsuccessful. Experimenters, however, have continued to expand educational possibilities through the development of open- and closed-circuit television, the creation of multimedia instructional systems, and the expansion of libraries into multimedia information storage and retrieval systems and the use of the computer as an instructional device.

Many of these newer technological developments have yet to touch the lives of the majority of students inside schools. One reason for this is that school environments have generally not been conducive to such developments. For example, most secondary schools are organized into sets of 45- to 50-minute time periods. Thus, educational films have generally been held between 10 and 20 minutes, which barely leaves time to orient the students to the film, show it to them, and then have discussion afterward. Such constraint not only affects the kinds of topics that can be treated but also results in superficial treatment of complex topics.

Despite some successes, closed circuit television has been very difficult to use in the classroom. As Guba and Snyder (1965) indicated, broadcast television paces instruction, requiring teacher and students to accept the flow of the broadcast medium. Teachers, however, had their own flow of instruction and never learned to incorporate the mediated episodes into their curricular patterns. More exotic uses of

the media, in which constraints of time and organization are ignored, have been infrequent. Elaborate game-type simulation, for example, is barely used at all, although wonderful simulations are available. Effective use requires schools to change.

Many know of schools have storage rooms filled with instructional aides that were going to revolutionalize instruction. If the history of educational innovations teaches anything, it should be that the environment must accept, even embrace the change, and skill level--ongoing staff development--must accompany the change. The application of media and technology to education requires a general school design that both guides the development of alternative educational forms and creates a congenial institutional framework in which these forms can be applied. The structure of the school is in many senses the medium of instruction; it facilitates certain kinds of learning modes and inhibits others. If the new technologies, such as the computer, are not carefully woven into the fabric of the school, they too will find their way to the storage closet.

Teacher Preparation and Credentialing for the Future

The Commission on Teacher Credentialing is the California State Agency that is charged with the primary responsibility of establishing standards for the preparation of public school personnel (teachers, administrators, counselors, and other certified support personnel) in grades 12 and below. There are two activities that the Commission is engaged in that will have

important and positive effects on the future of education in California. The first is the proposed reform of teacher preparation and certification and the second is the Commission's examination of role and impact of computer literacy in the preparation of teachers.

The reform package would establish a multistage credentialing process. The initial stage of preparation would lead to a preliminary teaching credential.

The second stage, called advanced preparation, is designed to provide teachers with the knowledge and assistance that the initial years of teaching require. The Advanced Teaching Credential is based on the following six principles and premises:

1. The Commission's concept of advanced preparation has been based on a recognition that the beginning years of teaching impose unique demands on teachers and that effective supports must be provided to new teachers as a result.

2. The concept of advanced preparation also recognizes that there are considerable differences from individual to individual in terms of skills, maturity and capabilities. Therefore, advanced preparation must focus on an individual teacher's needs.

3. Preliminary preparation cannot fully prepare teachers to meet the unique demands of the first classroom teaching job.

4. There are many experienced teachers and administrators who would be willing to help, counsel or guide beginning teachers.

5. Advanced preparation will concentrate on the teaching function by examining concepts of pedagogy, subject matter and techniques of instructional practice.

6. Advanced preparation recognizes that support for beginning teachers needs to be provided by appropriate advisors. New teachers have said that fellow teachers are the most helpful sources of ideas and

solutions to problems. The Commission's proposal will make this assistance more purposeful and systematic.

The Commission believes that its reform proposals will enable beginning teachers to receive the professional assistance they need from those most capable of giving aid at the time when it is critically needed.

In the third stage, experienced teachers would complete professional growth requirements to maintain the validity of their advanced teaching credential. The concept of professional growth is based on the following tenets:

1. Teachers must remain abreast of changes in society and in pedagogy.

2. The preparation of effective teachers is never complete and should continue as long as teachers practice the profession of teaching.

3. The ongoing validity of teachers' professional credentials should depend on continuing professional development.

4. Teachers should be able to pursue a rich variety of activities in the course of their professional growth.

5. Teachers should have significant roles in determining the course of their own programs of professional growth.

6. When the program and successful service are verified, the validity of the advanced teaching credential would be extended for another five years.

The proposed credentialing process is based on the genuine belief that knowledge and skills, colleagueship, peer assistance, and growth-producing activities ought to be at the center of the teaching profession and, therefore, the bases on which credentials are granted and extended.

The second issue on computer literacy relates to the Commission's desire to produce well-qualified teachers who

possess the kinds of skills individual teachers will need for the end of this and the next century. The purpose of this activity is to determine what (if any) standards related to computer literacy should be established for the preparation and certification of future teachers.

The Commission is in the process of surveying noted technologists, educators, and leaders from business and industry. Although the survey is far from complete, there are some preliminary findings. Those surveyed seem to agree on two points. First, that there should be a differentiated view of computer using teachers. These teachers seem to fall into three groups. The first group is teachers of computing, the second is teachers using computer software in their traditional courses and, finally, computer literate teachers who assign computer programming and simulation projects in their courses.

Information gathered by the Commission suggests that there definitely should be standards regarding the preparation and training of the first group. This group is important not only because they will present the major computer instruction for students, but also because they potentially can be the source of instruction and assistance for other teachers and be the catalysts in building the technological base for the school environment mentioned in the first section of this paper. There was consensus (although not unanimous) that the training for the first group should be done largely through colleges or universities.

The second group (computer software users) ought to have training but probably not as rigorous as the first group. The State Teacher Education and Computer (TEC) Centers or other in-service offerings are the ideal place for this group's training.

The group of computer literate teachers represents a concern of the future. As the first group does its job, the third group will need to be developed. They will need to be relatively familiar with computers and know at least one language. Their training could be handled as advanced preparation or as a professional growth activity.

For both of these activities, it is felt that teacher involvement is critical in the effective implementation of changes in training and curriculum, and the continuation of such changes. If the schools social system cannot embrace these attempts to improve schools and teaching, there is virtually no chance of their success.

Teachers and Students and the New Technology: Social Implications and Cautionary Notes

All one has to do is open this morning's newspaper to read another round of criticism about the inability of the schools to prepare the nation's youth for the future. In the same paper, society's latest artificial messiah, computer technology, is touted as the innovation to save the schools. While these articles and similar claims have some justification for their conclusions, most of these fail to take into consideration the school's social context.

Connected to its social milieu, tightly clasped by tradition and yet the medium of modern ideas and artifacts, the school floats paradoxically in an ocean of social forces. Technologies strengthen the school's potential and threaten to replace it. Its personnel receive very little training but are asked to manage one of the most complex professional tasks in society. Teachers have little status but awesome responsibilities, both for individual children and for the health of society as a whole.

In this last section, the social implications of current proposals for the improvement of teaching and the increased use of computer technology in the schools will be examined. What the Commission advocates is looking at the future of teaching and technology with our eyes open--examining both the positive and negative features of any change. The history of educational innovations demands no less.

Starting with the Commission's own Credentialing Reform Package, it is felt that the proposals are well-grounded in the research on teacher induction and staff development. The assistance to beginning teachers will result in more job-focused skill acquisition and teachers will feel supported rather than abandoned during their early years. On the other hand, Advanced Preparation places additional demands on the beginning teacher, on those that advise the beginning teacher and on the system. Each takes on new responsibilities in a profession where there are already too many pressures.

The professional growth provision of the proposed reform package also has aspects that can be seen as either positive or negative. Some teachers will see the elimination of credentials with no renewal requirements and the proposed continuing education requirements as punitive. For some, this is probably true; the Commission hopes not for most.

We expect the professional growth provision of the proposed reform package to have differential impact on experienced teachers. For the already growing teachers, there is a desire to recognize and endorse the kinds of activities in which they already engage. Teachers should be encouraged to engage in analysis of teaching and to try innovative ideas. Meeting the minimum requirements for renewal will be of little consequence because, routinely, these teachers far surpass the standards. It is felt that the report form will be extremely simple, with the paper work requiring an absolute minimum of time.

For passive or more reticent teachers, the growth requirements will serve as a prod to seek out growth activities, to join with other teachers in activities and, hopefully by being a learner, become enthused about being a teacher again. For the more withdrawn teachers, and in some cases the reticent or passive teachers, the professional growth requirements would be a clear message that teacher preparation is never complete and should continue as long as a teacher practices the profession of teaching.

Moving now to the potential of computer technology and its implications it can be seen that, just as "Sesame Street" has forced many teachers to change the process and substance of the early grades, the computer can make significant changes in later education. It can teach students to think in new ways, it can provide completely new curricular vistas for students and teachers, it can offer educational opportunities to previously inadequately served groups of students (such as the physically disabled who are only beginning to benefit from the computers and microelectronic technology) and it can free the teacher from some of the more mechanistic aspects of teaching so that the teacher's role can be more creative and challenging.

With all of computer technology's potential, there are dangers that need to be researched within the social context of the school. So far, the use of computers in school has widened the gaps between the "haves and have nots" in our schools. For example, the current computer technology literature reports:

- three times as many wealthy districts have computers as poorer districts
- two to three times as many boys as girls sign-up for computer classes
- higher achieving students are taught to use the computer as a problem solver while the lower achieving students typically get programmed instruction units
- the press for excellence and higher graduation requirements will almost automatically lead to more tracking and ability grouping

Besides the necessary amounts of skill training, teachers need to be trained in both the potential gains and losses from

the use of computer technology. Both the continued professional growth of teachers and the application of new technologies must be seen and applied within the social context.

Just as a computer requires connections among thousands of component parts, so too the process of schooling (and school improvement) requires the careful structuring of curriculum, professional growth opportunities, technology, and the social system in order to be successful.